



Agreements and Disagreements with Storms

Ed Pell*

Storms points out that cold fusion (LENR) does not produce a high energy particle as part of the final product. There is ample experimental proof of this and I agree.

Storms includes all lattice defects as being lattice and not potential reaction sites. I disagree. I still see lattice defects as potential sites, particularly single atom vacancies. I do agree that regular undisturbed lattice material is not where reactions occur, even when loaded greater than 0.9 with deuterium.

Storms states every system seeks the lowest Gibbs energy. I agree completely.

Storms points to cracks as the locations of reactions. He seems to be referring to cracks that have one small spacial dimension and two extended spacial dimensions. I disagree. I see two (or three) small spacial dimensions and one (or zero) extended spacial dimensions as required to forbid typical quantum mechanical behavior and allow a classical collapse of $d + e + d \rightarrow He + \text{free-electron}$. For me, small is significantly less than two Bohr radii, so an electron cannot form a self-reinforcing periodic orbit.

Storms makes three assumptions. I see no experimental evidence to tell us what the reactants or the products are for hydrogen on nickel, nor for deuterium on nickel, so I do not yet see a reason to have one mechanism or one site. I still consider $p(d) + Ni \rightarrow Cu$ as possibly the channel for both hydrogen and deuterium on nickel.

The section entitled "Proposed Mechanism Causing LENR" is the meat of the article; much is hinted at and much is unspecified. At the start we cannot tell if the line of protons and electrons proposed are vibrating bound particles, like atoms in a lattice, or free moving particles with thermal velocities that would take them out of a neat line in about 0.1 picoseconds. Storms seems to want the best of both worlds, but does not explain how that would work.

The other feature offered is a resonance. We are not told what is resonating, nor what is driving the resonance, nor how they are coupled. I do not see a stable, nor quasi-stable, resonator in the proposed line of charged particles.

Storms offers a reactants in/products out description that in the middle requires an extravagant use of the weak force to convert $e + p \rightarrow n$ on demand. This will require experimental proof before I would accept this channel, but it is worth keeping the idea open.

What it is that Storms finds appealing about small cracks needs more explicit statement. I find small confines that forbid typical quantum mechanic behavior and allow the electrostatic collapse of $d + e + d \rightarrow He + \text{free-electron}$ the most likely mechanism for cold fusion. I do not believe that a line of charged particles with two open dimensions can evade quantum mechanics. Quantum mechanics will lead to typical chemical behavior where an electron's average distance from a proton is about one Bohr radius and where two protons typically hold two Bohr radii apart by their respective electron clouds. I believe two restricted spacial dimensions are required. Storms seems to be offering one restricted dimension. How this works is not obvious.

Storms is one of the world's most capable and productive experimentalists in cold fusion. I look forward to his experimental results. I also look forward to an elaboration of his theory.

About the Author

Ed Pell has a B.S and M.S. in physics from Columbia University focusing on experimental particle physics. He has been in semiconductor product design, lithography and EDA (electronic design automation).

*Email: edpell@optonline.net